

XIX. *An Account of some Peculiarities in the anatomical Structure of the Wombat, with Observations on the female Organs of Generation.* By Everard Home, Esq. F.R.S.

Read June 23, 1808.

A MALE wombat was brought from the islands in Basse's Straits, by Mr. BROWN, the naturalist attached to Captain FLINDERS's voyage of discovery. It was entrusted to my care, and lived in a domesticated state for two years, which gave me opportunities of attending to its habits.

It burrowed in the ground whenever it had an opportunity, and covered itself in the earth with surprising quickness. It was quiet during the day, but constantly in motion in the night: was very sensible to cold; ate all kinds of vegetables; but was particularly fond of new hay, which it ate stalk by stalk, taking it into its mouth like a beaver, by small bits at a time. It was not wanting in intelligence, and appeared attached to those to whom it was accustomed, and who were kind to it. When it saw them, it would put up its fore paws on the knee, and when taken up would sleep in the lap. It allowed children to pull and carry it about, and when it bit them did not appear to do it in anger or with violence. It appeared to have arrived at its full growth, weighed about twenty pounds, and was about two feet two inches long.

The koala is another species of the wombat, which partakes of its peculiarities. The following account of it was sent to

me some years ago by Lieut. Colonel PATERSON, Lieutenant-Governor of New South Wales. The natives call it the koala wombat; it inhabits the forests of New Holland, about fifty or sixty miles to the south-west of Port Jackson, and was first brought to Port Jackson in August, 1803. It is commonly about two feet long and one high, in the girth about one foot and a half; it is covered with fine soft fur, lead coloured on the back, and white on the belly. The ears are short, erect, and pointed; the eyes generally ruminating, sometimes fiery and menacing; it bears no small resemblance to the bear in the fore part of its body; it has no tail; its posture for the most part is sitting.

The New Hollanders eat the flesh of this animal, and therefore readily join in the pursuit of it; they examine with wonderful rapidity and minuteness the branches of the loftiest gum trees; upon discovering the koala, they climb the tree in which it is seen with as much ease and expedition, as an European would mount a tolerably high ladder. Having reached the branches, which are sometimes forty or fifty feet from the ground, they follow the animal to the extremity of a bough, and either kill it with the tomahawk, or take it alive. The koala feeds upon the tender shoots of the blue gum tree, being more particularly fond of this than of any other food; it rests during the day on the tops of these trees, feeding at its ease, or sleeping. In the night it descends and prowls about, scratching up the ground in search of some particular roots; it seems to creep rather than walk: when incensed or hungry, it utters a long shrill yell and assumes a fierce and menacing look. They are found in pairs, and the young is carried by the mother on its shoulders. This animal

appears soon to form an attachment to the person who feeds it.

A specimen of this animal has since been sent to me in spirits; the viscera had been removed, but the male organs of generation, and the structure of the limbs, were the same as in the wombat. There was no subdivision of vessels in the groin as in the tardigrade animals.

The external form of the wombat has been described by M. GEOFFROY in the second volume of the *Annales du Museum National de France*; and several parts of its internal structure have been taken notice of by M. CUVIER in his *Leçons d'Anatomie comparée*. It only remains to mention such peculiarities as have either been slightly touched upon, or entirely passed over in the different accounts. Among these is the mechanism of the bones and muscles of the hind legs, which differs in many respects from that of all other animals, except the koala. The following account of it is drawn up at my desire, by Mr. BRODIE, from an accurate examination of the parts.

“There is no patella; but the tendon of the extensor muscles of the leg, where that bone is usually situated, is much thickened.

“The fibula is proportionably larger than in most animals. At the upper extremity it is broad, and has two distinct articulating surfaces: the anterior of which is articulated to the tibia, and the posterior to a small bone of a pyramidal shape, which is connected to the tendon of the external head of the gastro-cnemius muscle like a sesamoid bone. The lower extremity of the fibula is large, and forms about half of the articulating surface for receiving the tarsus at the ankle. An inter-articular cartilage is here interposed between the tibia

and the fibula, and another between the fibula and the tarsus.

“ The fibula has a slight degree of motion on the tibia at its upper end, and a half rotatory motion on it at its lower end. Between the two bones is a strong muscle, which passes from one to the other throughout their whole length. The fibres have their origin from the inner edge of the fibula, and pass obliquely inward and downward to be inserted into the opposite surface of the tibia. When this muscle contracts, it pulls the fibula forwards, and produces a degree of rotation on the tibia, which turns the toes inwards. The anterior surface of the muscle is covered by a thin fascia or interosseous ligament, and there is another fascia less complete on its posterior surface. The muscle of the leg, corresponding to the biceps flexor of the human subject, is inserted into the posterior part of the fibula, and is an antagonist to the muscle just described. Its action brings the toes back to a straight line, but does not turn them outwards.”

This mechanism is met with in two animals, whose mode of life is very different, the one living on trees, the other not ; but as they both burrow in the ground during the night, its use appears to be for throwing back the earth while the animal is burrowing. There is nothing at all similar to it in the hind legs of the mole, or other burrowing animals.

The internal structure of the stomach of the wombat resembles very closely that of the beaver, and is shewn in the annexed drawing. This is so different from that of the kangaroo, and all the other animals of the opossum tribe, that it forms a very extraordinary peculiarity.

The male organs of generation have been described by

CUVIER, with the exception of the prostate gland, which was supposed to be wanting. That distinguished anatomist could only have been led to this supposition from the parts in the specimen dissected being in an unfavourable state for examination. This gland resembles exactly that of the kangaroo, and is proportionably large.

The female organs have not been before described. The following description of them is particularly interesting, as the parts were in a state of impregnation, and they were examined immediately after the animal's death in New South Wales by Mr. BELL, a surgeon whose anatomical knowledge qualified him for the task. He unfortunately died soon after at Bombay. He sent the description to Sir JOSEPH BANKS, through whose kindness I received it.

Mr. BELL's Description of the female Organs of the Wombat.

“On laying open the cavity of the pelvis, I was surprised by the appearance of a double uterus, each of them distended into a pyramidal form; that of the right side was considerably the largest, and was about the size of a pullet's egg. From the fundus of each there was a Fallopian tube nearly three inches long terminating at the ovarium.

“The double uterus had one common neck half an inch long, and of considerable breadth and thickness: two lateral canals rose from the common neck on its posterior surface near its junction to the uteri, one on each side; they were about two inches long, having a semi-circular course, and terminated obliquely in the vagina.

“The uteri and their appendages were dissected out from

the body, and examined more particularly. On opening the vagina, it was found to terminate at the common neck of the uteri, on each side of which were the openings of the lateral canals, and in the middle between them the meatus urinarius, with a slender fleshy pedicle on each side of it. Behind the meatus urinarius were two orifices leading to the two uteri, but they were filled with a thick gelatinous substance which rendered them completely impervious.

“I made a longitudinal incision into the largest of the uteri, and found its coats lined with the same jelly met with in its os tincæ. Continuing the incision through this jelly, and at the same time using gentle pressure, there issued a quantity of a thin pellucid fluid, accompanied by an embryo wrapped up in very fine membranes, which contained some of the same transparent fluid. The membranes did not appear to be at all connected by vessels either to the uterus or gelatinous matter. I had no doubt of the other uterus containing a similar embryo in a less advanced state.

“Each uterus had evidently only one Fallopian tube and one ovarium; this tube had no swell or enlargement where it joins the uterus, as in the kangaroo. In both ovaria were appearances like corpora lutea, but that of the right side was most distinct. The lateral canals opened into the uteri just where the neck terminated in the cavity. I have omitted to note how far these canals were pervious.”

This account of Mr. BELL's, which differs so materially from that of the female organs of the kangaroo, corresponds exactly with that of the American opossum, only the parts are upon a larger scale; and it is found that the male organs of the wombat and koala are also similar to those of the

American opossum. These animals, therefore, form the intermediate link between the opossum and kangaroo.

These facts throw considerable light upon the mode of propagation of this very curious tribe of animals; and they confirm in the most satisfactory manner, the observations contained in a former paper upon the kangaroo, taken from a specimen which was sent to England preserved in spirits, and which was in an impregnated state, but the parts rendered very indistinct by being coagulated and long kept. In that instance the embryo was evidently surrounded by a coagulated jelly, and there was no connection between the foetus and the coats of the uterus. Further evidence was however required upon so new and interesting a subject; this is now obtained by Mr. BELL's examination of the impregnated uteri of an animal whose mode of generation is the same, made immediately after death.

By comparing the male and female organs of the kangaroo, wombat, and American opossum, it appears evident that the semen of the male is carried directly into the cavity of the uterus through the *os tincæ*, and not by the lateral canals, as has been generally believed. The proofs of this are the following: the number of lateral canals opening into the vagina is the same in all these three animals, but in the kangaroo there is only one *os tincæ*; in the wombat and American opossum there are two; the male kangaroo has a pointed single glans penis, while the wombat and American opossum have a bifid glans penis with a double orifice; and these two orifices in the state of erection of the penis, do not diverge from one another so as to apply themselves to the oblique openings of the lateral canals, but oppose the two *ora tincæ*, whose situation is well adapted to receive them.

When once it is established, that the foetus is nourished without a placenta, and that the semen is carried directly into the os tincae, we are led to enquire where this gelatinous matter for the nourishment of the foetus is formed ; it cannot be supposed to be secreted from the internal membrane of the uterus itself, which is constantly undergoing a change to adapt it to the encreased bulk of the foetus as well as of the jelly surrounding it. In birds, the albumen of the egg, which corresponds with this jelly, is formed in a tube adapted to that purpose called the oviduct, and these lateral canals, which open into the cavity of the uterus, bear a near resemblance in their form to the oviducts of birds ; in the kangaroo they are found in the impregnated state to be enlarged, and to have a very free communication with the uterus, while the extremity next the vagina is rendered impervious ; both of which circumstances induce me to believe that their sole use is to form this jelly, and to deposit it in the uterus.

In the bird, the yolk of the egg is the part first formed, and in its passage from the place of its formation, along the canal of the oviduct, the albumen is added to it, and the egg is completely formed before it receives the influence of the male ; but in all the different genera of the opossum tribe impregnation takes place in the same manner as in the quadruped, the small vesicular ovum receiving the influence of the male at the ovarium ; it then passes into the uterus, where it is deposited ; but instead of becoming attached to the coats of the uterus by means of a placenta, as in other quadrupeds, the gelatinous matter from the lateral canals every where surrounds it, and supplies the embryo with nourishment.

EXPLANATION OF THE PLATE.

The stomach of the male wombat inverted immediately after death and distended with air, so as to expose completely its internal surface, in which the glandular structure on the small curvature is exactly similar to that of the beaver.

The parts are of the natural size.

